

REMARKS

Claims 1-8 are pending and stand rejected.

Claim Amendments

Applicants amend claims 1 and 6 to correct minor typographical errors, namely to provide proper antecedent basis for various terms used in these claims. No new matter is added.

Claim Rejections

Claims 1-8 are rejected pursuant to 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,341,029 of Fillion et al. (“Fillion”) in view of JP 3-124385 of Sumitomo Metal Ind. Ltd. (“Sumitomo”) and U.S. Patent No. 6,252,195 of Mosavi et al. (“Mosavi”). The Examiner argues that Fillion discloses a laser apparatus having an acoustic optical element, which imparts vibrations to a laser beam. The Examiner admits that Fillion fails to teach a vibrating lens and a surgical needle workpiece, thus the Examiner relies on Sumitomo to teach a vibrating mirror or focusing lens and Mosavi to teach a surgical needle workpiece. The Examiner argues that it would have been obvious to use the lens of Sumitomo with the apparatus of Fillion because it is merely a design variation and rearrangement of parts, and it would have been obvious to use the surgical needle of Mosavi with the system of Sumitomo because the system of Sumitomo would ensure that a high quality bore hole could be formed in the needle. Applicants respectfully disagree.

Fillion is deficient for several reasons, in addition to those noted above by the Examiner. At the outset, independent claims 1 and 6 require a workpiece mounted on a vibrating frame. Fillion does not teach a workpiece mounted on a vibrating frame. The substrate (26) is mounted on a stage (24), but the stage (24) does not vibrate. Instead, it is driven along a y-axis. Movement along a direct path does not constitute vibration.

Claims 1 and 6 also requires a laser apparatus mounted to a second frame that does *not* vibrate. While Fillion teaches a laser apparatus that could be considered to be mounted to a frame that is separate than the frame containing the substrate, the laser apparatus is driven along an x-axis. Thus, to the extent the stage (24) is considered to vibrate, then the laser apparatus will

likewise vibrate. Fillion therefore fails to teach a first frame that vibrates and a second frame that does *not* vibrate.

Claims 1 and 6 also require a focusing lens that is mounted to the first vibrating frame and that vibrates in unison with the first vibrating frame. The mirror of Fillion is not mounted on the stage (i.e., the first frame containing the workpiece), but rather it is moves relative to the stage, i.e., along the x-axis, with the laser apparatus to allow deflection of the laser. Thus, even if the mirror of Fillion could be replaced with the lens of Sumitomo (which it cannot be for reasons discussed below), the lens would still not be mounted on the first vibrating frame containing the workpiece, and as a result the lens would likewise not vibrate with the workpiece, as required by claims 1 and 6.

Accordingly, Fillion is deficient for several reasons. Neither Sumitomo nor Mosavi remedy the deficiencies of Fillion. At the outset, the Examiner relies on Sumitomo to teach the claimed “spherical focusing lens,” but the Examiner has failed to point to any teaching in Sumitomo that the disclosed lens is spherical. Sumitomo merely discloses a focusing lens, and does not disclose a spherical lens, as required by claims 1 and 6. As noted above, Sumitomo also does not remedy the deficiencies of Fillion as Sumitomo likewise fails to teach a lens that is mounted on and vibrates with a vibrating substrate. To the contrary, Sumitomo’s lens vibrates *relative to* the substrate in order to vibrate the laser and thereby roughen the surface of the substrate. This is exactly contrary to the purpose of the claimed invention, in which the lens vibrates with the substrate in order to precisely focus the laser onto the substrate. Mosavi is merely relied on to teach features recited in dependent claims 3 and 8, and likewise fails to teach a lens mounted on a vibrating substrate. Mosavi also would not be relied on to modify the teachings of Fillion, as Fillion is not used to generate holes in a workpiece. Rather, Fillion is used for etching a surface – not to form holes in a substrate.

The Examiner has also overlooked the primary purpose of Fillion’s system. The goal of Fillion is to “dither” a light spot directed onto a substrate. That is, they generate small cyclical motions orthogonal to the scan motion so as to “paint” a wider line to compensate for any variations in the light source. The focusing lens of the present invention does not generate a wider

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spot or line, but rather does the exact opposite. It focuses the light source to a precise target location by vibrating with the workpiece, thereby compensating for any the motion of the workpiece relative to the laser. Accordingly, Fillion is entirely distinct from the claimed invention, and no person having ordinary skill in the art would modify Fillion to arrive at the claimed invention.

Independent claims 1 and 6, as well as claims 2-5 and 7-8 which depend therefrom, therefore distinguish over Fillion, Sumitomo, and Mosavi, and represent allowable subject matter.

Conclusion

In view of the above remarks, Applicant submits that all pending claims are in condition for allowance, and allowance thereof is respectfully requested.

Respectfully submitted,

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